Tiny Berry Tops Tomatoes in Lycopene

When Agricultural Research Service horticulturist Ingrid M. Fordham learned that the brilliant red berries on autumn olive—a multistem shrub—were edible, she turned them into delectable jam. In the process, she noticed that the berries' red pigment settled to the bottom of her juicer, and she wondered if it might be one of the carotenoids—a group of compounds that includes beta-carotene.

When ARS nutritionist Beverly A. Clevidence learned about the pigment, she offered to analyze the berries for carotenoids, especially lycopene—the pigment that colors tomatoes red.

"We were astounded at what we found," says Fordham, who is with the ARS Fruit Laboratory in Beltsville, Maryland. Ounce for ounce, the typical autumn olive berry is up to 17 times higher in lycopene than the typical raw tomato.

Lycopene has generated widespread interest as a possible deterrent to heart disease and cancers of the prostate, cervix, and gastrointestinal tract, says Clevidence, who heads ARS' Phytonutrients Laboratory in Beltsville. This health-giving pigment is also found in watermelon, pink grapefruit, and guava. But 80 to 90 percent of the U.S. intake comes from tomatoes and tomato products.

If future studies planned by Clevidence show that people readily absorb lycopene from the berries, they could become an ingredient in processed foods. "Not everybody likes tomatoes," she says, "and autumn olive could become an alternative source of a potentially important nutrient."

Autumn olive, *Elaeagnus umbellata,* is a nitrogen-fixing shrub covered with silvery-green leaves and a profusion of red berries in late September and October, says Fordham. Introduced from Asia in 1830, it has become a popular erosion-control shrub along highways because it thrives in poor soil. But this resilience has also made it a pest in some areas.

A handful of nurseries sell cultivated varieties of autumn olive as a food source to attract wildlife. "Birds love the beautiful red berries," says Fordham. But there are few reports of people eating the sweet-tart, pea-sized berries. She adds that the raw berries "taste good if they're nice and ripe."

Fordham collected berries from five cultivated varieties and six naturalized plants for analysis in Clevidence's lab. The berries contained the same carotenoids as tomato—lycopene, beta-carotene, and lutein, says Clevidence. The big difference was in the lycopene levels. They ranged from 15 to 54 milligrams per 100 grams, compared to an average of 3 milligrams per 100 grams for fresh tomatoes, 10 milligrams per 100 grams for canned tomatoes, and 30 milligrams per 100 grams for tomato paste.—By **Judy McBride,** ARS.

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